

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Divisional	)	
Patent Application of	)	
Serial No. 08/874,665	)	Group Art Unit: 2872
	)	
Nobuhiro KIHARA, et al.	)	Examiner: Chang, A.
	)	
Appln. No.: To Be Assigned	)	
	)	
Filed: April 2, 2001	)	
	)	
For: IMAGE RECORDING METHOD	)	
AND APPARATUS AND IMAGE	)	
REPRODUCING METHOD AND	)	
APPARATUS	)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

The present application is a divisional of the Patent Application No. 08/874,665 filed June 13, 1997. Prior to an initial examination of the above-identified patent application, please amend the application as follows:

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 2, line 11, with the following rewritten paragraph:

--For enabling an optimum picture to be produced from a holographic stereogram, it is necessary to completely fix a recording medium for hologram during light exposure of the recording image to prevent minute vibrations even of the order of the lightwave. During production of the holographic stereogram, the recording medium for hologram is moved little by little for

sequentially recording an extremely large number of hologram elements. For providing a practically useful picture recording device used for producing a holographic stereogram, the recording medium for hologram needs to be transferred quickly during fabrication of the holographic stereogram. Therefore, means for holding and transferring the recording medium for hologram needs to be such a device in which not only the recording medium for hologram can be transferred quickly, but also no vibrations of the recording medium for hologram are allowed after completion and halting of the recording medium for hologram.--

Please replace the paragraph beginning on page 5, line 9, with the following rewritten paragraph:

--For producing a transmission type hologram in which a three-dimensional image is reproduced by the light transmitted through the recording medium, a recording medium for hologram 311 is bounded to a surface 310a of a light inlet block 310 formed of a glass plate or a synthetic resin plate of a suitable thickness, as shown in Fig.2. At this time, the recording medium for hologram 311 is bonded via an index matching liquid 312 to the light inlet block 310. An object light beam from an object 313 is illuminated from an other surface 310b of the light inlet block 310 towards the recording medium for hologram 311, while a reference light beam 315 is illuminated from an end face 310c of the light inlet block 310 towards the recording medium for hologram 311. This completes a transmission type edge-lit hologram.--

Please replace the paragraph beginning on page 7, line 20, with the following rewritten paragraph:

--Moreover, if desired to assure a broad angle of visibility angle in the up-and-down direction in reproducing a holographic stereogram, a one-dimensional diffusion plate for diffusing the object light beam in a one-dimensional in-plane direction is desirably provided in the vicinity of the recording medium for hologram on the object light beam incident side. However, with the transmission type recording in which a light incident block needs to be arranged towards the object light beam incident side, it becomes to array this one-dimensional diffusion plate. Consequently, it has hitherto not been stereogram as a transmission type stereogram.--

Please replace the paragraph beginning on page 9, line 19, with the following rewritten paragraph:

--The optical component contacted with the recording medium for hologram via liquid is preferably a set of a one-dimensional diffusion plate and a louver film arranged on the object light incident side. For example, the optical component, comprised of the set of the one-dimensional diffusion plate and the louver film, is thrust, during recording on the recording medium for hologram, against the recording medium for hologram placed under pre-set tension. The one-dimensional diffusion plate performs the role of slightly diffusing the object light during recording in a one-dimensional direction for maintaining a broad angle of visibility in the up-and-down direction for scattering noise components ascribable to, for example, the optical system. On the other hand, the louver film prevents the reference light from

being reflected by, for example, the above-mentioned one-dimensional diffusion plate to be re-incident on the recording medium for hologram after passing through the recording medium for hologram.--

Please replace the paragraph beginning on page 11, line 4, with the following rewritten paragraph:

--For recording by the edge-lit system, the light inlet block can be contacted with the recording medium for hologram from the object light incident side or from the reference light incident side. However, even in case of recording by the edge-lit system, the one-dimensional diffusion plate and the louver film are preferably arranged in a contact area with the recording medium for hologram. In this case, the one-dimensional diffusion plate and the louver film are arranged on the object light inlet side, while the light inlet block is arranged on the reference light incident side of the recording medium for hologram. The light inlet block and the recording medium for hologram are contacted with each other via a liquid. If, in the following description, it is necessary to clarify the fact that the light inlet block is arranged on the reference light incident side., the light inlet block is termed a reference light inlet block. If the reference light inlet block is contacted with the recording medium for hologram the liquid interposed therebetween is preferably an index matching liquid responsible for index matching between the recording medium for hologram and the reference light inlet block.--

Please replace the paragraph beginning on page 39, line 7, with the following rewritten paragraph:

--Downstream of the UV lamp 47, the recording medium for hologram 19 is heated by the heat roll 48. This increases the refractive index modulation factor of the photopolymer layer 19b for fixing the recorded image.--

Please replace the paragraph beginning on page 47, line 25, with the following rewritten paragraph:

--Downstream of the UV lamp 47, the recording medium for hologram 19 is heated by the heat roll 48. This increases the refractive index modulation factor of the photopolymer layer 19b for fixing the recorded image.--

Please replace the paragraph beginning on page 52, line 23, with the following rewritten paragraph:

--For reproducing a holographic stereogram as the reflection type, a reproduced image can be usually obtained even if the white light is used as the reproducing illumination because the stereogram has a higher wavelength selectivity. Conversely, for regenerating a holographic stereogram as the reflection type, it becomes difficult to reproduce the holographic stereogram with the white light because the wavelength selectivity becomes weaker than the holographic stereogram is reproduced as the reflection type. Therefore, if a holographic stereogram is reproduced as the transmission type, a light source with a higher color purity is preferably used as a reproducing light source. Specifically, if a LED emitting the light of high color purity is used as a reproducing light source, it becomes possible to obtain a clear reproduced image. The LED also has merits that it is closer in nature to a point light source and hence is effective to prevent

blurring of the reproduced image due to spreading of the light source, and that it scarcely generates heat.--

Please replace the paragraph beginning on page 54, line 11, with the following rewritten paragraph:

--During recording by the edge-lit system, the reference light beam falls at an acute angle on the surface of the recording medium for hologram 19. Thus it is a frequent occurrence that this reference light beam be totally reflected on an interface between the reference light inlet block 52 and the recording medium for hologram 19 or irregularities on the surface of the recording photopolymer layer 19b of the recording medium for hologram 19 be presented on the image as stripes looking like wooden grains. It is therefore required of the liquid interposed between the recording medium for hologram 19 and the reference light inlet block 52 to achieve index matching between the recording medium for hologram 19 and the reference light inlet block 52. That is, the above conditions need to be selected so that no total reflection occurs on the interface between the reference light inlet block 52 and the recording medium for hologram 19 and so that the intensity reflectance (s-components) on each interface is reduced.--

Please replace the paragraph beginning on page 58, line 11, with following rewritten paragraph:

--It may be said that, for preventing total reflection on the respective interfaces and for sufficiently reducing the intensity reflectance for satisfying the condition for prevention of total reflection given by the above equations (7) and (8), it suffices to have the liquid 56 with the refractive index  $n_m$

satisfying the above equations (120 and (13) interposed between the reference light inlet block 52 and the recording medium for hologram 19.--

Please replace the paragraph beginning on page 59, line 25, with the following rewritten paragraph:

--Since the above equation (17) satisfies the above equation (15) which is in condition for preventing total reflection, it becomes possible to prevent total reflection occurring on the interfaces to suppress the intensity reflectance to a sufficiently small value is a liquid having the refractive index  $n_m$  in meeting with the equation (17) is used as the liquid 56 interposed between the reference light inlet block 52 and the recording medium for hologram 19.--

Please replace the paragraph beginning on page 60, line 7, with the following rewritten paragraph:

--If the reference light beam 55 is not incident at an acute angle on the surface of the recording medium for hologram 19, total reflection inherently is less liable to occur, while the intensity reflectance is also small, so that the condition required of the liquid 66 interposed between the reference light inlet block 52 and the recording medium for hologram 19 become extremely moderate. Therefore most of known organic solvents become usable as the liquid 56 satisfying the conditions for the refractive index 56.--

Please replace the paragraph beginning on page 60, line 17, with the following rewritten paragraph:

--In the foregoing, it is assumed that the reference light inlet block 42 is contacted via liquid 56 with the recording

medium for hologram 19, as shown in Fig.14, even in cases wherein the reference light beam 55 need not fall at an acute angle to the surface of the recording medium for hologram 19. However, in the first embodiment, since it is not only the reference light inlet block 52 but also the optical component 46, made of the one-dimensional diffusion plate 44 and the louver film 45, that are contacted via liquid 56 with the recording medium for hologram 19, there is produced certain deviation in the range of  $n_m$  due to the difference in refractive index between the reference light inlet block 52 and the optical component 46.--

Please replace the paragraph beginning on page 74, line 14, with the following rewritten paragraph:

The [light inlet block 137A] light inlet block 137A is used for routing the reference light to the recording medium for hologram 130. The reference light is incident on one end face of the light inlet block 147A. This light inlet block is supported by first thrusting roll 155A and a second thrusting roll 155B arranged on the object light incident on the reference light incident side. The first thrusting roll 155A and the second thrusting roll 155B are fixed while the third thrusting roll 155V is movable in the fore-and-aft direction as indicated by arrow d in Fig.22. The recording medium for hologram 130 is passed through a space between the first thrusting roll 155A and the light inlet block 130 and into a space between the second thrusting roll 155B and the light inlet block 130. In this space, the third thrusting roll 155C is moved as indicated by the arrow d in Fig.22 and exerts a pressure against the light inlet block 137A against the first thrusting roll 155A and the second thrusting roll 155B. In this manner, the recording medium for hologram 130 and the light inlet block 137A are supported with the recording medium for hologram 130 being pressed against the light inlet block 130.--



Please replace the paragraph beginning on page 79, line 6, with the following rewritten paragraph:

--A driving mechanism for the cutter 160 (cutter driving mechanism), not shown, drives the cutter 160, after a desired image is recorded on the hologram recording medium 130 based on the control signal S12 supplied from the control computer 104 and entire areas of the hologram recording medium 130 having the image recorded therein are subsequently discharged to outside, for severing the discharged portion from the remaining portion of the hologram recording medium 130. This enables the image-bearing portion of the hologram recording medium 130 to be discharged as a sole holographic stereogram.--

IN THE CLAIMS:

Please cancel claims 1-24 and add new claims 25-39 without prejudice or disclaimer.

25. (New) A method for simultaneously producing a hologram reproducible as both a reflection type hologram and a transmission type hologram, comprising:

sequentially generating image data of a parallax image string as strip- or dot-shaped hologram elements;

sequentially directing said image data to correspondingly selected portions of a recording medium for hologram;

contacting at least one surface of the recording medium for hologram with a light inlet block;

projecting an object light beam on a first surface of the recording medium for hologram through a one-dimensional diffusion plate located adjacent said first surface such that a void exists between said diffusion plate and said first surface; and

projecting a reference light beam on a second, opposite surface of the recording medium for hologram through said light inlet block, wherein the angle of incidence of said reference light beam and the refractive index of the recording medium are chosen such that said reference light beam is totally reflected by said first surface after passing through said recording medium.

26. (New) The method of claim 25, wherein said light inlet block is substantially columnar-shaped and is adapted for rotating movement.

27. (New) The method of claim 25, wherein a light path length of said object light beam is substantially equal to the light path length of said reference light beam.

28. (New) The method of claim 25, wherein said object light beam is projected substantially perpendicularly to the recording medium at a position on said first surface corresponding to an area of the recording medium in contact with said light inlet block along said second surface.

29. (New) The method of claim 25, wherein said light inlet block further includes a light absorbing member located in an internal hollow portion thereof, wherein said light absorbing member prevents undesired reflection of either said reference light beam or said object light beam within said light inlet block.

30. (New) An apparatus for simultaneously producing a hologram reproducible as both a reflection type hologram and a transmission type hologram, comprising:

a recording medium for hologram fed from a film cartridge between a light inlet block and a one-dimensional diffusion plate such that a void exists between a first surface of said recording medium and said diffusion plate and such that said light inlet block contacts a second surface of said recording medium;

means for sequentially advancing said recording medium;

means for sequentially generating image data of a parallax image string as strip- or dot-shaped hologram elements;

means for sequentially directing said image data to correspondingly selected portions of said recording medium;

means for projecting an object light beam on said first surface of the recording medium for hologram through said one-dimensional diffusion plate; and

means for projecting a reference light beam on said second surface of said recording medium through said light inlet block, wherein the angle of incidence of said reference light beam and the refractive index of the recording medium are chosen such that said reference light beam is totally reflected by said first surface after passing through said recording medium.

31. (New) The apparatus of claim 30, further including means for tensioning said recording medium in the area where said light inlet block contacts said second surface.

32. (New) The apparatus of claim 31, wherein said light inlet block is substantially columnar-shaped and is adapted for rotating movement.

33. (New) The apparatus of claim 30, wherein a light path length of said object light beam is substantially equal to the light path length of said reference light beam.

34. (New) The apparatus of claim 30, wherein said object light beam is projected substantially perpendicularly to said recording medium at a position on said first surface corresponding to an area of the recording medium in contact with said light inlet block along said second surface.

35. (New) The apparatus of claim 30, wherein said light inlet block further includes a light absorbing member located in an internal hollow portion thereof, wherein said light absorbing member prevents undesired reflection of either said reference light beam or said object light beam within said light inlet block.

36. (New) The apparatus of claim 30, wherein said recording medium includes a cover sheet for protecting a photosensitive surface, said cover sheet removed in said film cartridge before being fed between said light inlet block and said diffusion plate.

37. (New) The apparatus of claim 36, further including means for removing debris from said light inlet block.

38. (New) The apparatus of claim 30, further including a liquid-supplying means for continuously supplying a liquid between said light inlet block and said recording medium.

39. (New) The apparatus of claim 38, wherein said liquid is an index matching liquid for index matching between said recording medium and said light inlet block.

REMARKS

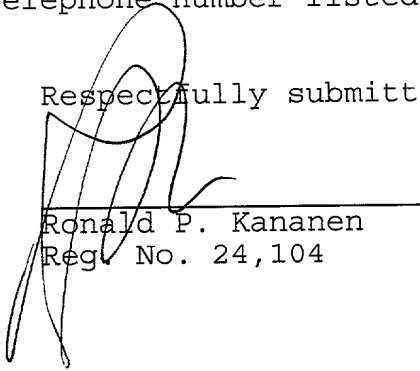
This is a voluntary preliminary amendment directed to claims 25-39 of the parent application and amended by preliminary amendment. No further changes are made to these claims. Reexamination and reconsideration are respectfully requested for claims 25-39.

It is requested that the art cited and made of record in the parent application be considered in this divisional application.

This Preliminary Amendment is requested to place the divisional application in the form of the parent prior to examination. Entry of the foregoing amendment prior to examination is respectfully requested. An early and favorable action on the material is respectfully requested. Should there be any questions regarding the application, the Examiner is invited to telephone the undersigned at telephone number listed below.

Respectfully submitted,

Date: April 2, 2001

  
Ronald P. Kananen  
Reg. No. 24,104

**RADER, FISHMAN & GRAUER, PLLC**  
The Lion Building  
1233 20<sup>th</sup> Street, N.W., Suite 501  
Washington, D.C. 20036  
Tel: (202) 955-3750  
Fax: (202) 955-3751

Customer No. 23353

APPENDIX

Please replace the paragraph beginning on page 2, line 11, with the following rewritten paragraph:

--For enabling an optimum picture to be produced from a holographic stereogram, [.] it is necessary to completely fix a recording medium for hologram during light exposure of the recording image to prevent minute vibrations even of the order of the lightwave. During production of the holographic stereogram, the recording medium for hologram is moved little by little for sequentially recording an extremely large number of hologram elements. For providing a practically useful picture recording device used for producing a holographic stereogram, the recording medium for hologram needs to be transferred quickly during fabrication of the holographic stereogram. Therefore, means for holding and transferring the recording medium for hologram needs to be such a device in which not only the recording medium for hologram can be transferred quickly, but also no vibrations of the recording medium for hologram are allowed after completion and halting of the recording medium for hologram.--

Please replace the paragraph beginning on page 5, line 9, with the following rewritten paragraph:

--For producing a transmission type hologram in which a three-dimensional image is reproduced by the light transmitted through the recording medium, a recording medium for hologram 311 is bounded to a surface 310a of a light inlet block 310 formed of a glass plate or a synthetic resin plate of a suitable thickness, as shown in Fig.2. [Atthis] At this time, the recording medium for hologram 311 is bonded via an index matching liquid 312 to the light inlet block 310. An object light beam from an object 313 is illuminated from an other surface 310b of the light inlet

block 310 towards the recording medium for hologram 311, while a reference light beam 315 is illuminated from an end face 310c of the light inlet block 310 towards the recording medium for hologram 311. This completes a transmission type edge-lit hologram.--

Please replace the paragraph beginning on page 7, line 20, with the following rewritten paragraph:

--Moreover, if desired to assure a broad angle of visibility angle in the up-and-down direction in reproducing a holographic stereogram, a one-dimensional diffusion plate for diffusing the object light beam in a one-dimensional in-plane direction is desirably provided in the vicinity of the recording medium for hologram on the object light beam incident side. However, with the transmission type recording [n] in which a light incident block needs to be arranged towards the object light beam incident side, it becomes to array this one-dimensional diffusion plate. Consequently, it has hitherto not been stereogram as a transmission type stereogram.--

Please replace the paragraph beginning on page 9, line 19, with the following rewritten paragraph:

--The optical component contacted with the recording medium for hologram via liquid is preferably a set of a one-dimensional diffusion plate and a louver film arranged on the object light incident side. For example, the optical component, comprised of the set of the one-dimensional diffusion plate and the louver film, is thrust, during recording on the recording medium for hologram, against the recording medium for hologram placed under pre-set tension. The one-dimensional diffusion plate performs the role of slightly diffusing the object light during recording in a [ono]one-dimensional direction for maintaining a broad angle of



visibility in the up-and-down direction for scattering noise components ascribable to, for example, the optical system. On the other hand, the louver film prevents the reference light from being reflected by, for example, the above-mentioned one-dimensional diffusion plate to be re-incident on the recording medium for hologram after passing through the recording medium for hologram.--

Please replace the paragraph beginning on page 11, line 4, with the following rewritten paragraph:

--For recording by the edge-lit system, the light inlet block can be contacted with the recording medium for hologram from the object light incident side or from the reference light incident side. However, even in case of recording by the edge-lit system, the one-dimensional diffusion plate and the louver film are preferably arranged in a contact area with the recording medium for hologram. In this case, the one-dimensional diffusion plate and the louver film are arranged on the object light inlet side, while the light inlet block is arranged on the reference light incident side of the recording medium for hologram. The light inlet block and the recording medium for hologram are contacted with each other via a liquid. If, in the following description, it is necessary to clarify the fact that the light inlet block is arranged on the reference light incident side., the light inlet block is termed a reference light inlet block. If the reference light inlet block [s] is contacted with the recording medium for hologram the liquid interposed therebetween is preferably an index matching liquid responsible for index matching between the recording medium for hologram and the reference light inlet block.--

Please replace the paragraph beginning on page 39, line 7, with the following rewritten paragraph:

--Downstream of the UV lamp 47, the recording medium for hologram 19 is heated by the heat [toll] roll 48. This increases the refractive index modulation factor of the photopolymer layer 19b for fixing the recorded image.--

Please replace the paragraph beginning on page 47, line 25, with the following rewritten paragraph:

--Downstream of the UV lamp 47, the recording medium for hologram 19 is heated by the heat [toll] roll 48. This increases the refractive index modulation factor of the photopolymer layer 19b for fixing the recorded image.--

Please replace the paragraph beginning on page 52, line 23, with the following rewritten paragraph:

--For reproducing a holographic stereogram as the reflection type, a reproduced image can be usually obtained even if the white light is used as the reproducing illumination because the stereogram has a higher wavelength selectivity. Conversely, for regenerating a holographic stereogram as the reflection type, it becomes difficult to reproduce the holographic stereogram with the white light because the wavelength selectivity becomes weaker than the holographic stereogram is reproduced as the reflection type. Therefore, if a holographic stereogram is reproduced as the transmission type, a light source with a higher color purity is preferably used as a reproducing light source. Specifically, if a LED emitting the light of high color purity is used as a reproducing light source, it becomes possible to obtain a clear reproduced image. The LED also has merits that it [s] is closer in nature to a [pont] point light source and hence is effective

to prevent blurring of the reproduced image due to spreading of the light source, and that it scarcely generates heat.--

Please replace the paragraph beginning on page 54, line 11, with the following rewritten paragraph:

--During recording by the edge-lit system, the reference light beam falls at an acute angle on the surface of the recording medium for hologram 19. Thus it is a frequent occurrence that this reference light beam be totally reflected on an interface between the reference light inlet block 52 and the recording medium for hologram 19 or irregularities on the surface of the recording photopolymer layer 19b of the recording medium for hologram 19 be presented on the image as stripes looking like wooden grains. It [s] is therefore required of the liquid interposed between the recording medium for hologram 19 and the reference light inlet block 52 to achieve index matching between the recording medium for hologram 19 and the reference light inlet block 52. That is, the above conditions need to be selected so that no total reflection occurs on the interface between the reference light inlet block 52 and the recording medium for hologram 19 and so that the intensity reflectance (s-components) on each interface is reduced.--

Please replace the paragraph beginning on page 58, line 11, with following rewritten paragraph:

--It may be said that, for preventing total reflection on the respective interfaces and for sufficiently reducing the intensity reflectance for satisfying the condition for prevention of total reflection given by the above equations (7) and (8), it suffices to have the liquid 56 with the refractive index  $n_m$

satisfying the above equations (120 and (13) interposed between the reference light [let] inlet block 52 and the recording medium for hologram 19.--

Please replace the paragraph beginning on page 59, line 25, with the following rewritten paragraph:

--Since the above equation (17) satisfies the above equation (15) which is in condition for preventing total reflection, it becomes possible to prevent total reflection occurring on the interfaces to suppress the intensity reflectance to a sufficiently small value is a liquid having the refractive index  $n_m$  in meeting with the equation (17) is used as the liquid 56 interposed between the reference light [let] inlet block 52 and the recording medium for hologram 19.--

Please replace the paragraph beginning on page 60, line 7, with the following rewritten paragraph:

--If the reference light beam 55 is not incident at an acute angle on the surface of the recording medium for hologram 19, total reflection inherently is less liable to occur, while the intensity reflectance is also small, so that the condition required of the liquid 66 interposed between the reference light [let] inlet block 52 and the recording medium for hologram 19 become extremely moderate. Therefore most of known organic solvents become usable as the liquid 56 satisfying the conditions for the refractive index 56.[.]--

Please replace the paragraph beginning on page 60, line 17, with the following rewritten paragraph:

--In the foregoing, it is assumed that the reference light [let] inlet block 42 is contacted via liquid 56 with the

recording medium for hologram 19, as shown in Fig.14, even in cases wherein the reference light beam 55 need not fall at an acute angle to the surface of the recording medium for hologram 19. However, in the first embodiment, since it is not only the reference light [let] inlet block 52 but also the optical component 46, made of the one-dimensional diffusion plate 44 and the louver film 45, that are contacted via liquid 56 with the recording medium for hologram 19, there is produced certain deviation in the range of  $n_m$  due to the difference in refractive index between the reference light inlet block 52 and the optical component 46.--

Please replace the paragraph beginning on page 74, line 14, with the following rewritten paragraph:

The [light inlet block 137A] light inlet block 137A is used for routing the reference light to the recording medium for hologram 130. The reference light is incident on [ne] one end face of the light inlet block 147A. This light inlet block is supported by first thrusting roll 155A and a second thrusting roll 155B arranged on the object light incident on the reference light incident side. The first thrusting roll 155A and the second thrusting roll 155B are fixed while the third thrusting roll 155V is movable in the fore-and-aft direction as indicated by arrow d in Fig.22. The recording medium for hologram 130 is passed through a space between the first thrusting roll 155A and the light inlet block 130 and into a space between the second thrusting roll 155B and the light inlet block 130. In this space, the third thrusting roll 155C is moved as indicated by the arrow d in Fig.22 and exerts a pressure against the light inlet block 137A against the first thrusting roll 155A and the second thrusting roll 155B. In this manner, the recording medium for hologram 130 and the light inlet block 137A are supported with the recording medium for hologram 130 being pressed against the

light inlet block 130.--

Please replace the paragraph beginning on page 79, line 6, with the following rewritten paragraph:

--A driving mechanism for the cutter 160 (cutter driving mechanism)[ ], not shown, drives the cutter 160, after a desired image is recorded on the hologram recording medium 130 based on the control signal S12 supplied from the control computer 104 and entire areas of the hologram recording medium 130 having the image recorded therein are subsequently discharged to outside, for severing the discharged portion from the remaining portion of the hologram recording medium 130. This enables the image-bearing portion of the hologram recording medium 130 to be discharged as a sole holographic stereogram.--

IN THE CLAIMS:

Please cancel claims 1-24 and add new claims 25-39 without prejudice or disclaimer.

25. (New) A method for simultaneously producing a hologram reproducible as both a reflection type hologram and a transmission type hologram, comprising:

sequentially generating image data of a parallax image string as strip- or dot-shaped hologram elements;

sequentially directing said image data to correspondingly selected portions of a recording medium for hologram;

contacting at least one surface of the recording medium for hologram with a light inlet block;

projecting an object light beam on a first surface of the recording medium for hologram through a one-dimensional diffusion plate located adjacent said first surface such that a void exists between said diffusion plate and said first surface; and

projecting a reference light beam on a second, opposite surface of the recording medium for hologram through said light inlet block, wherein the angle of incidence of said reference light beam and the refractive index of the recording medium are chosen such that said reference light beam is totally reflected by said first surface after passing through said recording medium.

26. (New) The method of claim [46]25, wherein said light inlet block is substantially columnar-shaped and is adapted for rotating movement.

27. (New) The method of claim [46]25, wherein a light path length of said object light beam is substantially equal to the light path length of said reference light beam.

28. (New) The method of claim [46]25, wherein said object light beam is projected substantially perpendicularly to the recording medium at a position on said first surface corresponding to an area of the recording medium in contact with said light inlet block along said second surface.

29. (New) The method of claim [46]25, wherein said light inlet block further includes a light absorbing member located in an internal hollow portion thereof, wherein said light absorbing member prevents undesired reflection of either said reference light beam or said object light beam within said light inlet block.

30. (New) An apparatus for simultaneously producing a hologram reproducible as both a reflection type hologram and a transmission type hologram, comprising:

a recording medium for hologram fed from a film cartridge between a light inlet block and a one-dimensional diffusion plate such that a void exists between a first surface of said recording medium and said diffusion plate and such that said light inlet block contacts a second surface of said recording medium;

means for sequentially advancing said recording medium;

means for sequentially generating image data of a parallax image string as strip- or dot-shaped hologram elements;

means for sequentially directing said image data to correspondingly selected portions of said recording medium;

means for projecting an object light beam on said first surface of the recording medium for hologram through said one-dimensional diffusion plate; and



means for projecting a reference light beam on said second surface of said recording medium through said light inlet block, wherein the angle of incidence of said reference light beam and the refractive index of the recording medium are chosen such that said reference light beam is totally reflected by said first surface after passing through said recording medium.

31. (New) The apparatus of claim [51]30, further including means for tensioning said recording medium in the area where said light inlet block contacts said second surface.

32. (New) The apparatus of claim [52]31, wherein said light inlet block is substantially columnar-shaped and is adapted for rotating movement.

33. (New) The apparatus of claim [51]30, wherein a light path length of said object light beam is substantially equal to the light path length of said reference light beam.

34. (New) The apparatus of claim [51]30, wherein said object light beam is projected substantially perpendicularly to said recording medium at a position on said first surface corresponding to an area of the recording medium in contact with said light inlet block along said second surface.

35. (New) The apparatus of claim [51]30, wherein said light inlet block further includes a light absorbing member located in an internal hollow portion thereof, wherein said light absorbing member prevents undesired reflection of either said reference light beam or said object light beam within said light inlet block.

36. (New) The apparatus of claim [51]30, wherein said recording medium includes a cover sheet for protecting a photosensitive surface, said cover sheet removed in said film cartridge before being fed between said light inlet block and said diffusion plate.

37. (New) The apparatus of claim [57]36, further including means for removing debris from said light inlet block.

38. (New) The apparatus of claim [51]30, further including a liquid-supplying means for continuously supplying a liquid between said light inlet block and said recording medium.

39. (New) The apparatus of claim [59]38, wherein said liquid is an index matching liquid for index matching between said recording medium and said light inlet block.